4.0 EXISTING ENVIRONMENT AND IMPACTS ANALYSIS

INTRODUCTION TO ENVIRONMENTAL ANALYSIS

Section 4.0, Existing Environment and Impacts Analysis, examines the potential environmental impacts of the proposed Project and project alternatives. This section includes analyses of the environmental issue areas listed below:

4.1 OPERATIONAL SAFETY/RISK OF ACCIDENTS
4.2 WATER QUALITY
4.3 BIOLOGICAL RESOURCES
4.4 COMMERCIAL AND SPORTS FISHERIES
4.5 LAND USE/RECREATION
4.6 AIR QUALITY
4.7 NOISE
4.8 VEHICULAR AND RAIL TRANSPORTATION
4.9 VISUAL RESOURCES/LIGHT AND GLARE
4.10 CULTURAL RESOURCES
4.11 GEOLOGICAL RESOURCES/STRUCTURAL INTEGRITY REVIEW
4.12 SOCIOECONOMICS
4.13 ENVIRONMENTAL JUSTICE

Each issue area section provides background information and describes the environmental setting (baseline conditions) to help the reader understand the conditions that would be affected by an impact(s). In addition, each section describes how an impact is determined to be "significant" or "less than significant." Finally, the individual sections recommend mitigation measures to reduce significant impacts. Throughout Section 4.0, Existing Environment and Impacts Analysis, both impacts and the corresponding mitigation measures are identified by a bold **letter-number designation,** e.g., Impact **BIO-1** and mitigation measure **MM BIO-1a.**

Based on an initial review and analysis, it is likely that the proposed Project would have a less than significant impact, or no impact, on the environmental issue areas identified below. The primary reasons for these determinations are as follows:

- Air Quality. The current emissions output of Long Wharf operations is permitted. Because no significant construction projects, nor an increase in throughput, are planned as part of the proposed Project, no adverse impact to air quality as a result of the proposed Project is anticipated;

- Vehicular and Rail Transportation. The proposed Project would not increase vehicular traffic during the lease period. No impacts would occur; and

Cultural Resources. The Long Wharf is not eligible as a historic resource and there are no other potential historical resources in the project area, thus there are no impacts. In addition, there are no shipwrecks near the Long Wharf; thus, there would be no impacts on cultural resources from standard maintenance dredging.

ASSESSMENT METHODOLOGY

Environmental Baseline

The analysis of each issue area begins with an examination of the existing physical setting (baseline conditions as determined pursuant to section 15125(a) of the State CEQA Guidelines) that may be affected by the proposed Project. The effects of the proposed Project are defined as changes to the environmental setting that are attributable to project components or operation.

Significance Criteria

Significance criteria are identified for each environmental issue area. The significance criteria serve as a benchmark for determining if a component action will result in a significant adverse environmental impact when evaluated against the baseline. Environment means "...a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project..."

Impact Analysis

Impacts are classified as:

- **Class I** (significant adverse impact that remains significant after mitigation);
- **Class II** (significant adverse impact that can be eliminated or reduced below an issue's significance criteria);
- **Class III** (adverse impact that does not meet or exceed an issue's significance criteria); or
- **Class IV** (beneficial impact).

A determination will be made, based on the analysis of any impact within each affected environmental issue area and compliance with any recommended mitigation measure(s), of the level of impact remaining in comparison to the pertinent significance criteria. If the impact remains significant at or above the significance criteria, it is deemed to be Class I. If a "significant adverse impact" is reduced, based on compliance with mitigation, to a level below the pertinent significance criteria, it is determined to no longer have a significant effect on the environment, i.e., to be "less than significant" (Class II). If an action creates an adverse impact above the baseline condition, but such impact does not meet or exceed the pertinent significance criteria, it is determined to be adverse, but less than significant (Class III). An action that provides an improvement to an environmental issue area in comparison to the baseline information is recognized as a beneficial impact (Class IV).

Formulation of Mitigation Measures and Mitigation Monitoring Program

When significant impacts are identified, feasible mitigation measures are formulated to eliminate or reduce the intensity of the impacts and focus on the protection of sensitive resources. The effectiveness of a mitigation measure is subsequently determined by evaluating the impact remaining after its application. Those impacts meeting or exceeding the impact significance criteria after mitigation are considered residual impacts that remain significant (Class I). Implementation of more than one mitigation measure may be needed to reduce an impact below a level of significance. The mitigation measures recommended in this document are identified in the impact assessment sections and presented in a Mitigation Monitoring Program (MMP). The MMP is provided in Section 6.0, Mitigation Monitoring Program.

If any mitigation measures become incorporated as part of a project's design, they are no longer considered mitigation measures under the CEQA. If they eliminate or reduce a potentially significant impact to a level below the significance criteria, they eliminate the potential for that significant impact since the "measure" is now a component of the action. Such measures incorporated into the project design have the same status as any "applicant proposed measures." The CSLC's practice is to include all measures to eliminate or reduce the environmental impacts of a proposed Project, whether applicant proposed or recommended mitigation, in the MMP.

Impacts of Alternatives

Section 3.0, Alternatives and Cumulative Projects, provides a list, a description, and a map that identify alternatives to the proposed Project and the cumulative projects baseline. Each issue area in Section 4.0, Existing Environment and Impacts Analysis, presents the impact analysis for each alternative scenario. A summary of the collective impacts of each alternative in comparison with the proposed Project is included within the Executive Summary Section.

Cumulative Projects Impacts Analysis

Each issue area in Section 4.0, Existing Environment and Impacts, presents the cumulative impact, the focus of which is to identify the potential impacts of the Project that might not be significant when considered alone, but that might contribute to a significant impact when viewed in conjunction with the other projects.

APPLICATION OF OIL SPILL MODELING AND GIS ANALYSIS

The impact analysis of the proposed Project includes the evaluation of the consequences of oil spills that could result from an accident associated with Long Wharf operations, including tanker transit. New oil spill modeling specific to the Long Wharf and the approach to the Long Wharf has been conducted for this impact analysis. Information was also obtained from previous modeling conducted for the Unocal facility (Chambers Group 1994). Specifically, prior data on spread of spills within vessel transit lanes within the Bay and outer coast were used.

The oil spill modeling specific to the Long Wharf projected the spread of oil under selection conditions (size of spill, instantaneous or slow release of crude or product, location of release, current conditions, and wind direction) for five geographic segments of the Bay deemed to be of primary importance based on the need to evaluate oil spill response capability during the first 24 hours of a spill combined with the presence and location of sensitive resources. These five geographic segments and the need to evaluation the first 24-hour response were developed in consultation with the CSLC and OSPR staff. OSPR staff recommended these five segments, as they are considered sensitive and hard to respond to quickly. In addition, OSPR staff recommended that 1,000 bbl-size spills be modeled as they were deemed to be the most "realistic" in their probable occurrence.

GIS environmental resource data layers for resources in the Bay and specifically near the marine terminal were updated. Modeled spills were integrated with resource information through the GIS to produce numerical and/or graphical data sets that depict the extent of resource areas contacted by representative spills. In addition to maps, tables were produced giving acreage and/or percentage of resources in a given area that could be impacted by various spills.

The analyses and conclusions in the impact sections were based on the risk that oil would contact sensitive resource areas. For the modeled spill scenarios, it is recognized that areas identified as most crucial are not the only areas where resources may be impacted. If an identified area is not contacted by oil, it does not mean that there will be no impacts to a particular resource given the right set of spill, current, and wind conditions. The analyses recognize that given the right spill conditions, virtually all resources within the Bay *could* be impacted. The intent of the analysis, herein, is to develop reasonable mitigation measures for the protection of resources most likely to be impacted from the most probable accidents. These measures are not meant to duplicate those contained within OSPR's Area Contingency Plan, but to further protect resources against spills, and to provide rapid response containment and cleanup specific to the Long Wharf that would be applied by Chevron within the first 24 hours of an incident. The modeling was used for the analyses of biological resources, commercial and recreational fisheries, and land use/recreational resources.

The discussion below describes the process used to select the representative oil spill scenarios used for modeling impacts in the Bay, followed by a discussion of previous modeling and its application in this document.

Development of Representative Oil Spill Scenarios

Selection Process

To determine the range of potential effects resulting from an oil spill at the Long Wharf in San Francisco Bay, 100 randomly generated scenarios involving a 1,000-bbl oil spill were run. The oil simulation model, OSRISK, is described below under "Oil Spill Simulation Model." Through discussions with representatives of the OSPR of the CDFG, the 1,000-bbl oil spill size was selected as being "realistic" in terms of an occurrence. Each scenario simulated the effects of wind and tides on an oil spill occurring at the Long Wharf, starting at a randomly selected tidal state and time of year. Modeling can generate a wide range of results; the selected scenarios were designed to assist in creating a set of "typical" oil spill incidents.

Although each geographic segment is affected by at least 1 of the 100 randomly generated scenarios, 5 geographic segments were determined to be of particular interest based on the need to evaluate oil spill response capability during the first 24 hours of a spill, and the presence of sensitive resources. These five sensitive segments are Berkeley/Emeryville, Brooks Island/Richmond, South-East San Pablo Bay, West San Pablo Bay, and West-Central Bay. The greater study area of San Francisco Bay is divided into 14 smaller geographic segments as shown in Figure 4.0-1 with the five segments highlighted.

Each of the 100 scenarios simulated an instantaneous 1,000-bbl release at the Long Wharf. A random wind sequence and tidal state were selected for each scenario. In computer animations, each oil particle is represented in the model as a colored "dot," moving as an oil particle would under the environmental conditions simulated by the model. The particle stops moving when the oil particle it represents comes into contact with solid land (as opposed to a mud flat) and ceases to be influenced by wind and tides. The day when a particle stops moving and remains "stuck" to a particular segment is determined to be the day that oil first appeared at that segment.

The number of oil particles varied among scenarios. Degree of oiling was determined by counting the proportion of the oil particles present in a segment at the end of Day 3 of the spill. Degree of oiling was classified as follows:

- A segment that received 1 to 10 percent (1-100 bbls) of the total oil spilled was classified as receiving trace amounts of oil;

- A segment that received 11 to 20 percent (101-200 bbls) of the total oil spilled was classified as being "lightly" oiled;

Figure 4.0-1 – The San Francisco Bay Study Area Divided into 14 Smaller Geographic Segments

- A segment that received 21 to 30 percent (201-300 bbls) of the total oil spilled was classified as being "moderately" oiled; and

- A segment that received greater than 30 percent (> 300 bbls) of the total oil spilled was classified as being "heavily" oiled.

Figure 4.0-2 shows the effects of the 100 scenarios on each of the 14 geographic segments within San Francisco Bay. Effects include the degree of oiling and the day oil first appeared at each segment.

Figure 4.0-3 compares the 14 geographic segments in terms of number and degree of oilings. Figure 4.0-3 was constructed by summing the number of times each different type of oiling (trace, light, moderate, or heavy) occurred at each segment. The Long Wharf is in the East-Central Bay segment. In the simulations, this segment had the highest incidence of oiling.

The number and degree of oilings of the sensitive segments varied. The Brooks Island/Richmond segment had the second highest occurrence of oilings overall (57) and just over half of these were heavy. Berkeley/Emeryville and South-East San Pablo Bay were oiled 25 times. Almost half of the Berkeley/Emeryville oilings were heavy, while the majority of oilings in South-East San Pablo Bay left trace amounts of oil. West-Central Bay was oiled less than 10 times, with half the oilings being heavy and the other half leaving trace amounts of oil. The West San Pablo Bay segment had the fewest oilings overall. Half of these were moderate and the other half left trace amounts of oil.

A representative scenario was chosen for each of the five sensitive segments based on the degree of oiling, day oil first appeared, and overall extent of oiling. For example, Scenario No. 73 was chosen as a spill representative of impacts to the Brooks Island/Richmond segment. This spill scenario resulted in heavy oiling to the Brooks Island/Richmond segment beginning on Day 1. The Brooks Island/Richmond segment was oiled in 57 of the 100 scenarios. In 44 of these scenarios, the oil first appeared on Day 1, and in 37 of these scenarios, the segment was heavily oiled. The representative scenarios for each of the five sensitive segments are described below. Appendix B contains an hour-by-hour description of the spread of oil until the oil is beached.

Berkeley/Emeryville (No. 33): Scenario No. 33 (Figure 4.0-4) begins at high tide near the turning of the tide. A moderate wind from the west is blowing. Seventeen hours into Day 1, the wind increases and changes direction to blow from the southwest. By the end of Day 1, 84 percent of the oil is beached. Seven hours into Day 2 the wind changes again and blows from the west. The scenario ends near high tide at the end of Day 2. At this point all of the oil is beached, mostly between the Oakland Bay Bridge and Point Molate.

Figure 4.0-2a – Table 1. Results of 100 Randomly Generated Oil Spill Scenarios on 14 Segments of San Francisco Bay

Figure 4.0-2b – Table 1. Results of 100 Randomly Generated Oil Spill Scenarios on 14 Segments of San Francisco Bay

Figure 4.0-2c – Table 1. Results of 100 Randomly Generated Oil Spill Scenarios on 14 Segments of San Francisco Bay

Figure 4.0-3 – Number and Degree of Oilings Resulting from Oil Spill Scenarios Originating from the Long Wharf

Figure 4.0-4 – Berkeley/Emeryville Oil Spread Scenario

Brooks Island/Richmond (No. 73): Scenario No. 73 (Figure 4.0-5) begins at low tide near the turning of the tide with a weak westerly wind. Low tide occurs again 13 hours into the scenario. The wind remains weak, but changes to blow from the east. At the end of Day 1, 21 percent of the oil is beached. The wind weakens even more and becomes intermittent. The wind increases 19 hours later, becoming strong and westerly. At the end of Day 2, 52 percent of the oil is beached. The scenario ends 22 hours into Day 2 at high tide with all the oil beached, mostly from Berkeley Pier to Point San Pablo.

South-East San Pablo Bay (No. 93): Scenario No. 93 (Figure 4.0-6) begins at low tide with strong westerly winds. By the end of Day 1, southwesterly winds are dominating and 76 percent of the oil is beached. The scenario ends at the end of Day 2 with all oil particles beached. Most oil particles come ashore between Castro Point to the entrance of the Carquinez Strait. Flood tide is beginning at this point and moderate winds are blowing from the west.

West-Central Bay (No. 68): Scenario No. 68 (Figure 4.0-7) begins at low tide with a weak, intermittent wind. After 16 hours all the oil is still afloat, but the wind has become moderate and easterly. All oil remains afloat at low tide at the end of Day 1. By the end of Day 2, 84 percent of the oil is beached in West-Central Bay, driven by easterly winds and the incoming tide. The scenario ends at the end of Day 3. At this point the wind is becoming southeasterly and the tide is at mid-ebb. All of the oil is beached, the majority between Point Chauncy and northern San Rafael Bay.

West San Pablo Bay (No. 91): Scenario No. 91 (Figure 4.0-8) begins in the middle of flood tide with strong southeasterly winds. By low tide at the end of Day 1, 86 percent of the oil is beached somewhere in the Bay. By high tide at the end of Day 2, the wind has become northeasterly and 99 percent of the oil is beached. The scenario ends mid-flood with strong westerly winds blowing. Approximately 33 percent of the oil is beached between Long Wharf and Point San Pablo. Approximately 33 percent is beached in San Rafael Bay, and the remainder is beached between Hamilton Air Force Base and the mouth of the Petaluma River.

<u>Oil Spill Simulation Model</u>

OSRISK (Ford et al. 1994), simulates an oil spill occurring under a specific set of conditions, taking into account the time of year, wind conditions, tidal state, spill volume, chemical composition, the extent of tidally inundated substrates, and other factors. The spill is represented as a cluster of independently moving points (called Lagrangian elements), each one representing a spatial fraction of the entire spill volume. The basic model output for a given oil spill scenario is a list of the position of the Lagrangian elements at specified points in time. Oil particles are not permitted to cross-exposed mud or marsh, or they are assumed to strand if they are already over these substrates as the tide ebbs.

Figure 4.0-5 – Brooks Island/Richmond Oil Spread Scenario

Figure 4.0-6 – South-East San Pablo Bay Oil Spread Scenario

Figure 4.0-7 – West-Central Bay Oil Spread Scenario

Figure 4.0-8 – West San Pablo Bay Oil Spread Scenario

OSRISK is not an all-encompassing oil spill simulation model because it does not contain fixed components for generating wind or surface current vector fields. Surface currents are simulated using output from the U.C. Davis RMA-2V model (Shrestha et al. 1994). RMA-2V is a finite element model for the solution of the two-dimensional depth averaged shallow water flow equations. It is capable of simulating either time-dependent or steady-state systems, and is well suited to analysis of both estuary and river systems. This model was used to prepare three hydrologic data sets for use by OSRISK, each one representing a different level of inflow from the Bay Delta. RMA-2V transmits data to OSRISK in the form of lists of the current direction, current speed, and surface elevation at each node at 30-minute intervals. OSRISK uses these data to determine the velocity vector for each Lagrangian element at each time step. Surface elevation and velocity vectors for the Lagrangian elements were computed by interpolating between the velocity vectors at nodes adjacent to the position of each Lagrangian element. The estimated surface elevation was used to determine whether or not a Lagrangian element was temporarily stranded on a periodically inundated substrate.

The surface current fields are combined with real-time sequences of wind speed and direction. Wind data for San Francisco Bay were based on measured wind speeds and directions provided by the BAAQMD. Data are from 14 representative sites around the Bay Area. Speeds and directions were recorded at 1-hour intervals during 1990 and 1991. Wind velocities were transformed from the recording anemometer height to a standard height to correct for altitudinal variation in wind speed. The 14 stations were used to define a triangular mesh covering the study area. At each time step, OSRISK locates the triangle containing each Lagrangian element and estimates the wind vector by inverse distance-weighted interpolation from the surrounding nodes. OSRISK works by selecting a wind sequence and proceeding along that sequence until the end of the model run. Model results therefore closely reflect real-time wind events throughout the Bay Area.

The shoreline was digitized using USGS 1:24,000 topographic maps and was merged with the USFWS National Wetlands Inventory coverage. Lagrangian elements floating over mud or through a marsh were assumed to be stranded in the tidal elevation estimated from the output of the RMA-2V model as less than the corresponding bottom depth. Oil was assumed to move through marshy areas until it contacts the landward side of the marsh boundary.

OSRISK simulates the process of spreading by adding a random diffusive component to the advection induced by winds and currents at each model time step. The larger the random factor and the larger the number of Lagrangian elements used to simulate the slick, the more rapidly the slick expands and the more extensive the region affected by the slick. The areal extent of the spill is simulated by assuming that each Lagrangian element has a radius denoting the area affected by the volume of oil represented by each Lagrangian element. The spreading rate of the model slicks was calibrated by selecting a random diffusive factor and number of Lagrangian elements such that the area affected by the model slicks matched observations of the areal extent of real slicks of a given volume (Ford and Casey 1985).

Previous Oil Spill Modeling

This EIR also uses results from oil spill modeling previously conducted as part of the EIR prepared for consideration of a new lease for the Unocal (now TOSCO) Marine Terminal located at Oleum, in Contra Costa County (Chambers Group 1994). This earlier modeling used the same model OSRISK as described above, and involved a much larger and more detailed modeling effort, some of which applies to this current project. Pertinent information is provided in the following subsections.

Modeling Approach

The purpose of the scenario analysis conducted for the Unocal EIR was to analyze how a particular spill could behave over a period of time. The OSRISK model was also used for the Unocal EIR. The scenarios chosen were representative of a specific set of conditions, depicting the movement of oil over time and the size of the affected area. This modeling covered neither every type of spill nor all potential movements of a particular spill. The modeling effort was intended to identify the range of potential impacts associated with various sizes of oil spills, emphasizing the potential impacts under the more prevailing conditions.

San Francisco Bay and the outer coast were examined for the types and potential for tanker accidents. The history of spills and accidents that have occurred in the Bay Area was examined and the types of accidents and the consequences of such accidents that could occur were considered, including terminal pipeline leakage, vessel collisions with terminal structures, groundings, vessel collisions, and hull failure.

Larger spills were assumed to occur at a constant release rate over 24 hours. Tides were chosen to be either maximum ebb or flood near the spill site at the beginning of the outflow. Two seasonal variations for each scenario consisted of one wind sequence from the summer and one from the winter/spring. Summer winds tend to blow consistently from the west, while winter/spring winds are strong, but variable, and are frequently associated with the passage of storms.

Summary of Scenario Models

Of the 14 reasonable worst-case scenarios modeled for the Unocal EIR, 6 apply to the Long Wharf and are described below. These scenarios were used as additional information for the analysis of impacts associated with the Long Wharf, as they represent hypothetical accidents for large spills along the Bay tankering route and outer coast and with variation in seasonality. The extent of oil movement from these spills is described below. A summary of the model results is presented in Table 4.0-1. The effects of spill response actions on the spread of the oil were not considered; however, the maximum extent of oil spread was included.

Table 4.0-1
Summary of Scenario Model Runs

Scenario	Location	Spill Size (bbl)	Outflow	Spill Type	Wind/ Current	Duration
Bay No. 9	Near Alcatraz	100,000	24 hours	Crude	03-01-90/ Flood	3 days, 9 hours
Bay No. 10	Near Alcatraz	100,000	24 hours	Crude	09-11-91/ Flood	4 days, 9 hours
Bay No. 11	Anchorage 9	1,000	Instantaneous	Crude	11-26-91/ Flood	2 days, 12 hours
Bay No. 12	Anchorage 9	1,000	Instantaneous	Crude	08-16-90/ Flood	2 days, 15 hours
Outer Coast No. 1	Southeast of Farallon Islands	100,000	24 hours	Crude	03-90	8 days, 22 hours
Outer Coast No. 2	Southwest of Punta Gorda	100,000	24 hours	Crude	10-91	18 days, 10 hours

Figures for the Bay scenario results are included in this section. Figures showing results of the outer coast modeling are presented in Appendix B.

Bay Scenario Results

Bay Scenario No. 9 was a 100,000-bbl spill of crude oil released over a 24-hour period in the tanker lane near Alcatraz Island (Figure 4.0-9). The modeled spill was moved by a flood tide and winds beginning March 1, 1990; all spill elements had beached or moved out of the model domain after 3 days, 9 hours. Moved by winds and currents, oil spread extensively throughout central and northern San Francisco Bay and was then carried northward in scattered small slicks into central San Pablo Bay. Near-continuous contact with the shoreline occurred from Point Bonita, at the entrance to San Francisco Bay, along the Marin County shore of Richardson Bay, Tiburon, and Angel Island. In San Francisco, oil contacted the shoreline from the Presidio and Golden Gate Bridge to India Basin. In Contra Costa County, the shore from Richmond and Marina Bay to Point San Pablo was extensively contacted with oil. Most oil carried into San Pablo Bay eventually beached along the northeastern shore from Sonoma Creek to the Mare Island breakwater.

Figure 4.0-9 – Bay Scenario No. 9-100,000 bbl Crude Spill Near Alcatraz Island, March Wind/Flood Tide

Bay Scenario No. 10 was a 100,000-bbl spill of crude oil released over a 24-hour period in the tanker lane near Alcatraz Island (Figure 4.0-10). The modeled spill was moved by a flood tide and winds beginning September 11, 1991; all spill elements had beached or moved out of the model domain after 4 days, 9 hours. Most oil from this spill remained in the central San Francisco Bay, where virtually all waters were heavily or repeatedly contacted. Extensive oiling occurred in San Francisco from Seal Rocks at the entrance to the Bay, along the shore to the San Francisco-Oakland Bay Bridge and China Basin, and Alcatraz and Yerba Buena Islands. Across the Bay, oiling was continuous from Oakland International Airport northward to Red Rock and Castro Rocks near the Richmond-San Rafael Bridge.

Bay Scenario No. 11 was a 1,000-bbl spill of crude oil released at Anchorage 9 about 5 km southwest of Hunters Point (Figure 4.0-11). The modeled spill was moved by a flood tide and winds beginning November 26, 1991; all spill elements had beached after 60 hours. Within 3 hours, a compact slick moved into the South Bay, 4 to 5 km off San Francisco International Airport. The slick then spread and dispersed widely to contact waters, mudflats, the shore, and marshes of San Mateo County south of the Dumbarton Bridge and Santa Clara County to about Guadalupe Slough.

Bay Scenario No. 12 was a 1,000-bbl spill of crude oil released at Anchorage 9 about 5 km southwest of Hunters Point (Figure 4.0-12). The modeled spill was moved by a flood tide and winds beginning August 16, 1990; all spill elements had beached after 63 hours. Within 3 hours, a compact slick moved into the South Bay, 4 to 5 km off San Francisco International Airport. The slick then spread and dispersed widely to contact waters, mudflats, marshes, and the shore of Alameda County from Coyote Hills Slough to Calaveras Point.

Outer Coast Modeling

The 100,000-bbl spills of crude oil for the Outer Coast Scenarios No. 1 and No. 2 were designed to examine the potential fate of spilled oil from spill locations, and wind and current conditions pushing oil from the Golden Gate north to the Oregon border. Model results along the California coast from San Diego north to Point Arena, north of San Francisco, was also used from the Gaviota Terminal Company (GTC) Gaviota Marine Terminal Final Supplements EIR/EIS (Aspen Environmental Group 1992). Details on scenarios models for the outer coast are contained in Appendix B.

Figure 4.0-10 – Bay Scenario No. 10-100,000 bbl Crude Spill Near Alcatraz Island, September Wind/Flood Tide

Figure 4.0-11 – Bay Scenario No. 11-1,000 bbl Crude Spill at Anchorage, No. 9, November Wind/Flood Tide

Figure 4.0-12 – Bay Scenario No. 12-1,000 bbl Crude Spill at Anchorage, No. 9, August Wind/Flood Tide

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